



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,825	03/28/2006	Xiaoqiang Xu	274330US6PCT	8732
22850	7590	04/13/2010		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
DEHGHAN, QUEENIE S				
ART UNIT		PAPER NUMBER		
1791				
NOTIFICATION DATE		DELIVERY MODE		
04/13/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

### Office Action Summary

**Application No.**

10/541,825

**Applicant(s)**

XU ET AL.

**Examiner**

QUEENIE DEHGHAN

**Art Unit**

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14 and 16-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14, 16-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 14, 18, 21, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell (3,345,147) in view of Cole, Jr. (3,518,069). Regarding claims 14 and 21, Russell discloses a heat exchanger device comprising at least one fin including means for blowing a fluid, wherein the blowing means are uniform and include at least one wall of the fin, the at least one wall having open porosity (figures 4 and 5, col. 5, lines 23-29, col. 3 lines 44-49, col. 6 lines 24-30). Russell also teaches an example wherein the fin is made of a metal mesh with a porosity of the wall is 30% (col. 6 lines 14-15). Russell further teaches other porous materials can be used for the fin, just as long as the porosity has the desire permeability to retain a cooling liquid from freely flowing through while yet still allowing for volatized gases to pass (col. 7 lines 57-

64). Naturally, varying the material of the fins would also vary the porosity of the fin. Cole, Jr. also teaches a similar heat exchanger device with fins comprising a porous material and the evaporation of the cooling fluid within the fin (col. 3 lines 3-13). Cole, Jr. teaches the open porosity of the porous material is a result effective variable that can be adjusted based on the material selected and the amount of heat to be removed (col. 4 lines 19-23). It would have been obvious to one of ordinary skill in the art at the time of the invention to have optimized the open porosity (i.e. 17%) of the porous material of the fins of Russell as it has been demonstrated to be a result effective variable for achieving the desired cooling effect.

4. Regarding claim 18, a blowing fluid velocity field is symmetric across the at least one open porosity wall (figure 5, col. 7 lines 31-34).

5. Regarding claim 25, the blowing fluid results from vaporization within the fin of a fluid that was initially in a liquid state (col. 7 lines 20-30).

6. Regarding claim 26, the apparatus further comprises an auxiliary cooling circuit wherein the manifold is also cooled in addition to the fins (col. 4 lines 50-55).

7. Claims 16-17 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell (3,345,147) and Cole, Jr. (3,518,069), as applied to claim 14 above.

Russell discloses the fin is of parallelepipedal overall shape and tubular cross section (figure 6). Russell also teaches that permeability is a result effective variable of the material selected for achieving the desired resistance against the free flow of the cooling fluid and hence the desired cooling effect (col. 7 lines 49-72). It would have been obvious to one of ordinary skill in the art at the time of the invention to have

optimized the permeability of the cooling fin (such as to a value in the range from 500 to 600 Sm<sup>3</sup>/h/m<sup>2</sup>) as it is a known result effective variable for achieving the desired cooling effect of the cooling fins.

8. Claims 19-20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell (3,345,147) and Cole, Jr. (3,518,069), as applied to claim 14 above in further view of Suh et al. (4,270,951). Russell teaches the cooling fins can be made via several different porous materials (col. 7 lines 64-72). Xiao teaches the cooling fins can be made from sintered metal powder comprising stainless steel and nickel. However, both do specify a metal powder mixture of stainless steel, brass and nickel with a particular particle size. Suh et al. teaches a method for sintering powder metal parts comprising a mixture of various metal powders including nickel, brass, and stainless steel, with particles having a size smaller than 100µm (col. 3 lines 29-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized other known porous materials such as the sintered powder metal parts comprising of known sinterable metal powders such as nickel, brass and stainless steel of Suh in the apparatus of Russell as a known equivalent to porous material of Russell for achieving the predictable result of controlling the evaporation of the cooling fluid and hence the cooling effect of the fins while being able to handle the high temperature environment of the molten glass. Furthermore, it would have been obvious to one of ordinary skill in the art to have optimized the particle size of the metal powder (i.e. 10-80 µm) for achieving the desired porosity of the sintered metal powder part.

***Response to Arguments***

9. Applicant's arguments, filed January 22, 2010, with respect to the rejection(s) of claim(s) 14 under Xiao and under Russell alone have been fully considered and are persuasive in light of the translation of the foreign priority document submitted. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Cole, Jr.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **QUEENIE DEGHAN** whose telephone number is

(571)272-8209. The examiner can normally be reached on Monday through Friday 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/

Supervisory Patent Examiner, Art  
Unit 1791

Q Dehghan